

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. **(Previously Presented)** A method of representing an object appearing in a still or video image, by processing signals corresponding to the image, the method comprising:

deriving a curvature scale space (CSS) representation of the object outline by smoothing the object outline,

deriving at least one additional parameter reflecting the shape or mass distribution of a smoothed version of the original curve, and

associating the CSS representation and the additional parameter as a shape descriptor of the object,

wherein the at least one additional parameter corresponds to the eccentricity of the outline.

2. **(Original)** A method as claimed in claim 1 wherein an additional parameter relates to the smoothed outline corresponding to a peak in the CSS image.

3. **(Original)** A method as claimed in claim 2 wherein an additional parameter relates to the smoothed outline corresponding to the highest peak in the CSS image.

4-5. **(Canceled).**

6. **(Previously Presented)** A method as claimed in claim 1 wherein at least one additional parameter uses a region-based representation.

7. **(Original)** A method as claimed in claim 6 wherein an additional parameter is a region moment invariant.

8. **(Previously Presented)** A method as claimed in claim 6 wherein an additional parameter is based on Fourier descriptors.

9. **(Original)** A method as claimed in claim 6 wherein an additional parameter is based on Zernike moments of the region enclosed by the outline.

10. **(Previously Presented)** A control device for representing an object appearing in an image by processing signals corresponding to the image, comprising:  
a controller for performing the steps of:

deriving a curvature scale space (CSS) representation of an object outline  
by smoothing the object outline,

deriving at least one additional parameter reflecting shape or mass  
distribution of a smoothed version of original curve for the object outline, and

associating the CSS representation and the additional parameter as a  
shape descriptor of the object,

wherein the at least one additional parameter corresponds to the eccentricity of the outline.

11. **(Currently Amended)** A method as claimed in claim 40 37 wherein the additional parameter for an object outline is based on region moment invariants, Fourier descriptors or Zernike moments of the outline.

12-24. **(Canceled).**

25. **(Currently Amended)** An apparatus for deriving a representation of an object in an image comprising a control device as claimed in claim 24 10 and storage area for storing images and/or representations of images.

26. **(Previously Presented)** An apparatus as claimed in claim 25 wherein the storage area is an image database and/or a descriptor database.

27. **(Previously Presented)** An apparatus as claimed in claim 25 or claim 26 further comprising a display.

28. **(Currently Amended)** A method for representing an object appearing in an image, comprising:

determining a curvature scale space representation for an object outline to generate a plurality of curves representative of said outline; and

determining characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of a smoothed version of said outline to generate a shape descriptor for said outline.

29. **(Previously Presented)** The method of claim 28, further comprising:  
storing said shape descriptor as a description for said object in a memory.

30. **(Previously Presented)** The method of claim 28, wherein said determining a curvature scale space representation includes determining zero crossing points for an initial set of curves generated to produce said plurality of curves representative of said outline.

31. **(Currently Amended)** A method for identifying an outline of an object, comprising:

identifying an object outline as a shape descriptor and storing said outline in a memory, wherein said identifying includes:

determining a curvature scale space representation for an object outline to generate a plurality of curves representative of said outline; and

determining characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of a smoothed ~~portion~~ version of said outline to generate said shape descriptor for said outline.

32. **(Currently Amended)** A method for recovering an outline of an object appearing in an image, comprising:

recovering an object outline from a shape descriptor wherein said shape descriptor being generated by:

determining a curvature scale space representation for an object outline to generate a plurality of curves representative of said outline; and

determining characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of a smoothed ~~portion~~ version of said outline to generate said shape descriptor for said outline.

33. **(Currently Amended)** A method for propagating a signal, comprising:

generating a signal including a plurality of video images wherein said images include a plurality of objects having outlines; and

encoding said objects onto said signal using a description language to define at least a shape descriptor generated using a curvature scale space representation for an object outline, including a plurality of fields, for at least one selected object wherein said fields include a field representing the eccentricity of a smoothed version of said outline.

34. **(Currently Amended)** A system for representing an object appearing in an image, comprising:

a controller and a detector for determining a curvature scale space representation for an object outline to generate a plurality of curves representative of

said outline;

wherein said controller to determine characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of a smoothed version of said outline to generate a shape descriptor for said outline; and

a memory for storing said shape descriptor as a description for said object in a memory.

**35. (Currently Amended)** A system for recovering an outline of an object, comprising:

a controller and a detector for recovering an object outline from a shape descriptor, wherein said controller and detector to determine a curvature scale space representation for said object outline to generate a plurality of curves representative of said outline;

wherein said controller to determine characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of a smoothed ~~portion~~ version of said outline to generate said shape descriptor for said outline; and

a memory for storing said shape descriptor as a description for said object in a memory.

**36. (Currently Amended)** A machine-readable medium having stored thereon a plurality of executable instructions, the plurality of instructions comprising instructions to:

determine a curvature scale space representation for an object outline to generate a plurality of curves representative of said outline;

determine characteristics associated with said outline including peaks and associated peak coordinates for said plurality of curves and eccentricity of a smoothed version of said outline to generate a shape descriptor for said outline; and

store said shape descriptor as a description for said object in a memory.

**37. (New)** A method of representing a plurality of objects appearing in a still or video image, by processing signals corresponding to the images, the method comprising,

for each object outline, determining if there are significant changes in curvature in the object outline, and,

if there are significant changes in curvature of the object outline, then deriving a shape descriptor using a method as claimed in any one of claims 1 to 3 and 6 to 9 and,

if there are no significant changes in curvature of the object outline, then deriving a shape descriptor including at least said-additional parameter reflecting the shape of the object outline.